

holic." I asked, "Did he ever have this type of withdrawal symptoms before?" "Yes," she replied. I felt frustrated and disgusted. Do we physicians have to learn some tricks in lie detection, too? I cannot understand why those coming to a hospital or to a doctor for help would lie (exceptions are the addicts whose motives at the outset are clear). We physicians start working with patients with a feeling of mutual trust and understanding. If one party (or the close family of the same) is lying and hiding information, how are you expected to react and function? A clinical history, I learned, is most important in diagnosis—or should I say a "correct history"? Public education about this is extremely important.

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## More on Gravity Inversion

TO THE EDITOR: During the past year gravity inversion therapy has attracted considerable attention. The popular press has publicized gravity inversion boots, devices constructed of metal and foam rubber that clasp around the ankles, allowing one to hang in the completely (–90 degree) inverted posture from a stationary horizontal bar. In addition, there are other gravity inversion modalities, such as the gravity oscillator which not only allows the user to invert but to control body position while lying on an oscillating plank that allows one to rotate from an upright to a totally inverted posture with little effort. We chose the latter method for our latest investigation in this area.

Gravity inversion equipment was designed by Robert Martin, MD, in the 1960s to aid patients in relief of low back pain by utilizing gravity and their own body weight to decompress the spine and vertebral discs through inversion.<sup>1</sup> In our first series of studies we statically inverted subjects for three minutes and noted elevations in systemic blood pressure, intraocular pressure, central retinal artery pressure and pulse rate.<sup>2,3</sup> In these studies we first examined healthy medical students, and in other studies statically suspended borderline hypertensive volunteers for a three-minute period of inversion.<sup>4</sup> We interpreted our initial evaluations as a risk to specific patient populations (those with uncontrolled hypertension and those with uncontrolled glaucoma).

In view of our new work in this area, however, we have modified our opinion of the safety of gravity inversion therapy for healthy participants. We subjected 20 healthy volunteers with no history of glaucoma or hypertension to 15 minutes of oscillation on the gravity guider oscillator. Subjects were allowed to control their own rate of oscillation and performed from 80 to 150 complete oscillations during the 15-minute period, with each oscillation lasting for at least six seconds. Measurements were taken at rest, seated and then after 15 minutes of oscillation. Pulse rates were measured from the right radial pulse. Blood pressure was measured with an aeroid sphygmomanometer with the right arm supported laterally at the heart level for all measure-

ments. Intraocular pressure was determined utilizing the MacKay-Marg model 12 applanation tonometer. Ophthalmodynamometry was used for central retinal arterial pressure measurements.<sup>5</sup> All measurements were taken in the (–90 degree) inverted position.

We found the systemic blood pressure to decrease from 122/80 mm of mercury in the upright position to 120/78 mm of mercury after 15 minutes of oscillation. Pulse rate dropped from 76 to 72 in the same time. Intraocular and central retinal arterial pressure increased in a similar fashion to static inversion but of less magnitude. All the above results were statistically significant. None of our subjects had the discomfort of static inversion (headaches, nausea, head congestion, dizziness). They all reported a calm, relaxed feeling of well-being and tranquillity, which was associated with progressively diminished blood pressure and pulse rates below resting levels. The hydrostatic increase<sup>3,4</sup> in intraocular and central retinal artery pressure balance and protect each other with a "balloon pressing against a balloon within a box" effect.<sup>5</sup> Each prevents the other from damage.

The risk of stroke expressed in previous studies has been grossly exaggerated by the media. To date there has not been a single case of reported stroke or cerebrovascular accident associated with all forms of inversion therapy during the last 15 years they have been popular. Protection against brain hemorrhage may be afforded by the concomitant increase in cerebrospinal fluid, as well as the closed box system of the skull cage, previously demonstrated in the aerospace literature,<sup>6</sup> with the ability of unprotected laboratory animals to withstand negative 15 Gs of pressure. In addition, blood pressure elevations of 450/310 mm of mercury have been recorded in persons undergoing extensive weight training in the upright posture, which far exceeds any results we have encountered with gravity inversion equipment.<sup>7</sup>

In summary, we conclude that the oscillating gravity guider device is a safe manner of utilizing gravity inversion therapy. In addition, it is suggested that all these devices be utilized by keeping in motion to avoid the congestive effects of static hanging.

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